

amire 
authoring mixed reality

Authoring Mixed Reality A Component and Framework- Based Approach

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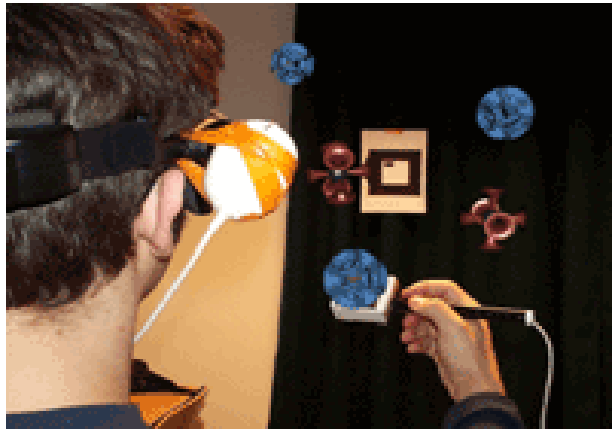
State of the Art in MR

- Base technologies
- European projects (ARVIKA, STAR,...)
- Focus on Image/video based techniques
- Human/Avatar like interaction interfaces (VIRTUE)
- Japanese MR projects

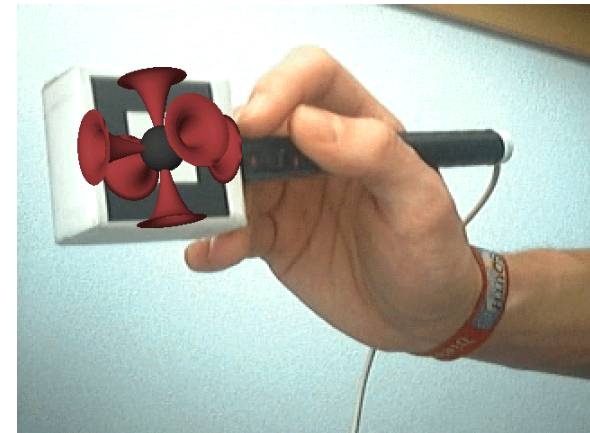
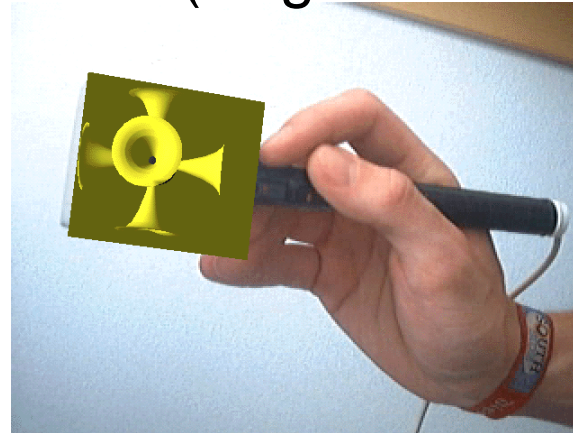
Work of C-LAB



Work of FH Hagenberg



ASR (Augmented Sound Reality)



www.fhs-hagenberg.ac.at/staff/haller

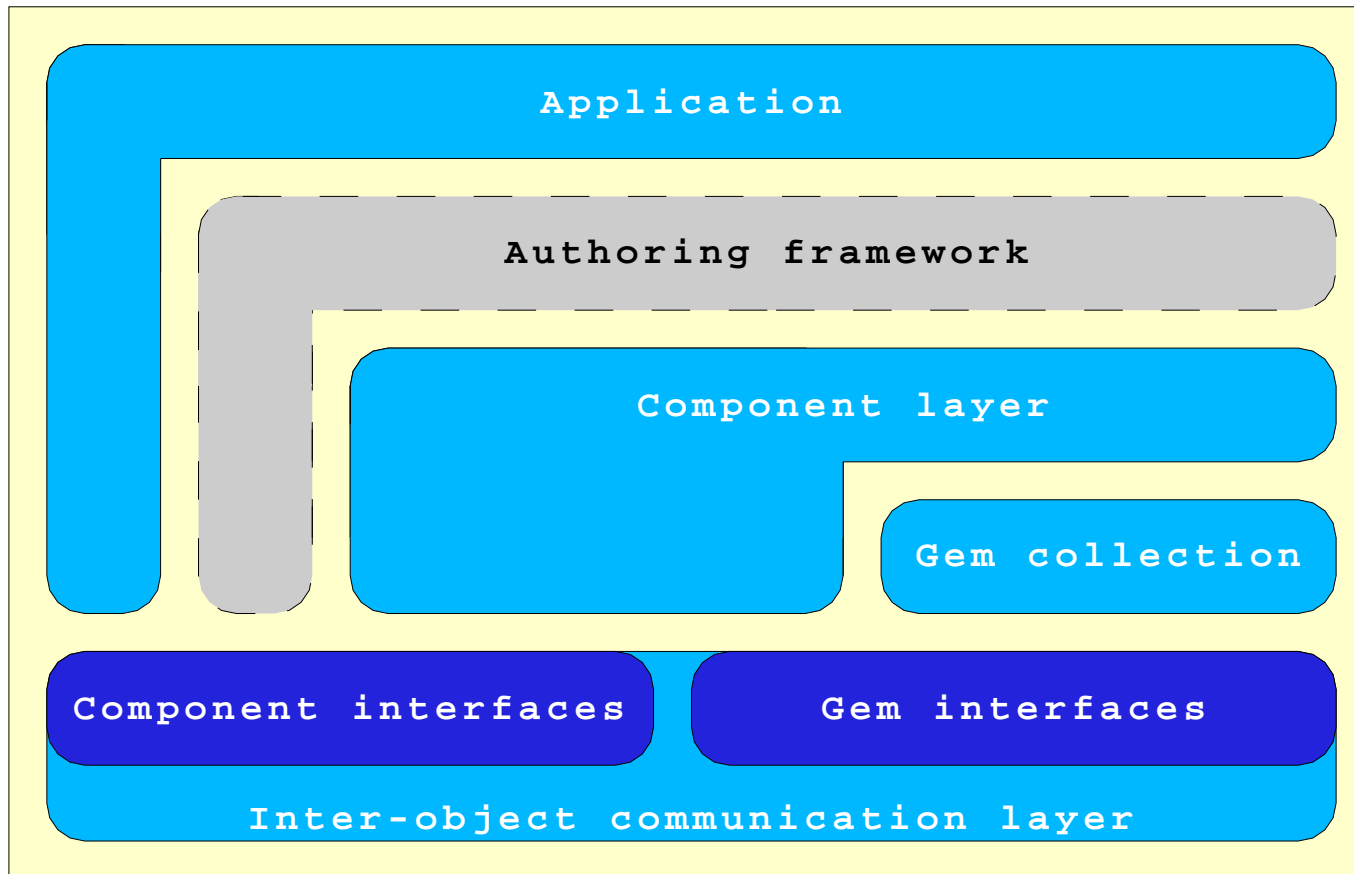
AMIRE

- = Authoring Mixed Reality
- IST Project (European Funded)
- 9 Partners coming from Austria, Finland, Germany, and Spain
- Computer graphics / MR specialists + usability experts + end users
- April 2002 - July 2004

Objectives

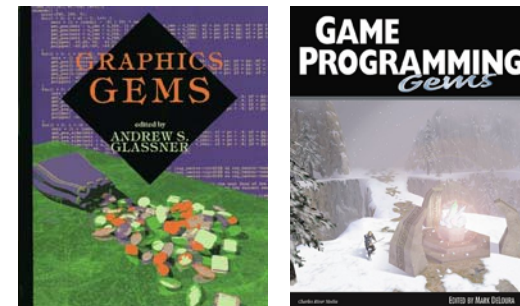
- Efficiently facilitate the creation and modification of mixed reality applications
 - More widespread use
 - Transfer of MR into different application domains
 - Authoring as new application domain
- Two demonstrators:
 - Training application for an oil refinery (OMV)
 - Museum application (Museum of Bilbao)
- Trigger and contribute to standardization

Gems, Components, Framework



Gems

- Collection of techniques and algorithms for programmers
- Share and reuse ideas and tools
- Provide a variety of innovative solutions to programming problems



MR Gems

- Solutions for tasks in MR applications
- 3rd party libraries/APIs
 - Existing solutions are extended to support their application in AMIRE components and other applications (e.g. through appropriate classifications, documentation, coding conventions)
- Hardware specific
- E.g. object recognition, tracking, camera control,...

MR Gems II

- **Problem:**

- Efficient 3rd party solutions for common tasks in MR applications are difficult to find and reuse.

- **State of the Art:**

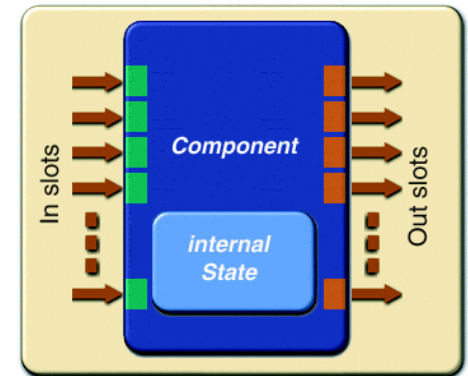
- Many projects build their own MR algorithms and techniques – there are no established standards and sharing/reuse is not supported as a primary goal.

- **Approach:**

- Collect established solutions to individual tasks into a library of MR GEMs.

MR Components

- Well designed interface
 - Consist of geometry model and behavior
 - High-level and domain-specific
 - Re-usable, customizable and adaptable
- Inter-Object Communication
- Stored in component library
- Cost effective application development



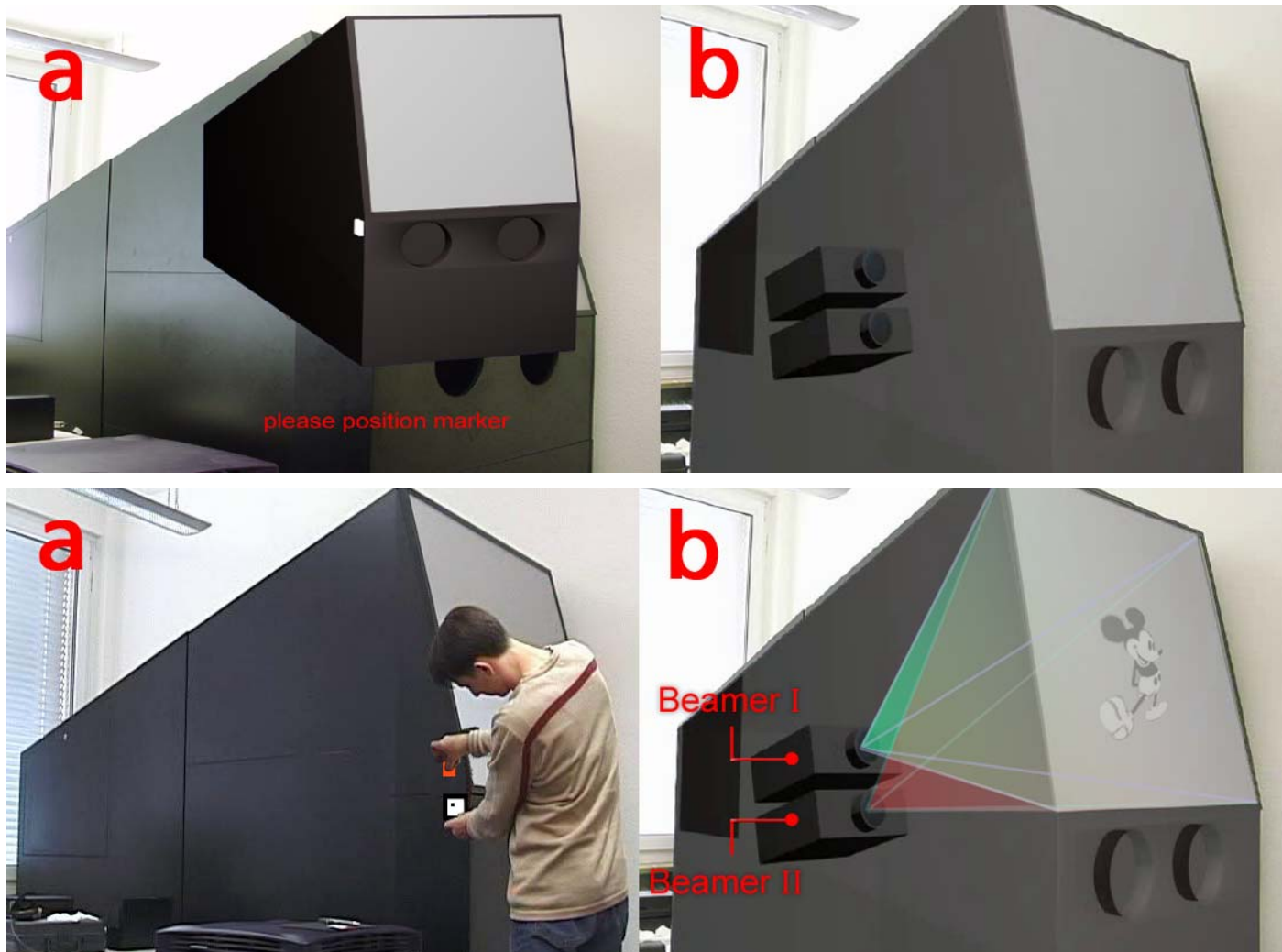
MR Framework

- Framework as glue between gems and components
- Framework offers a High Level API and an Interface for the components
- MR Runtime Framework
- Authoring Framework

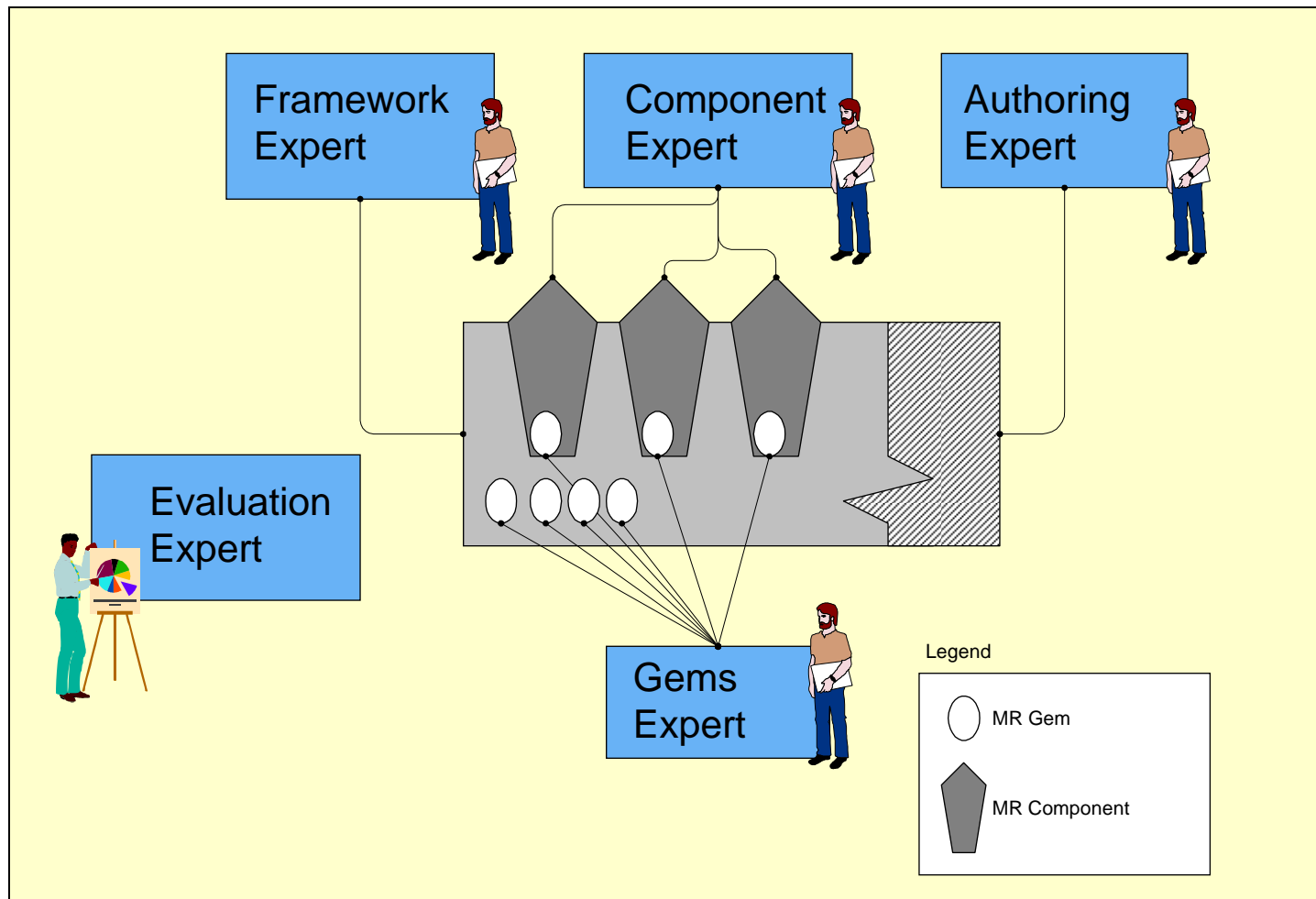
Authoring Process - Ideas

- Do not simulate Reality – use Reality during the authoring process
- No traditional Modelling (Authoring tools) for the Design Process of a MR application
- Leave the author in his familiar surroundings
- Make interfaces “realistic”

Authoring process



The different MR experts...



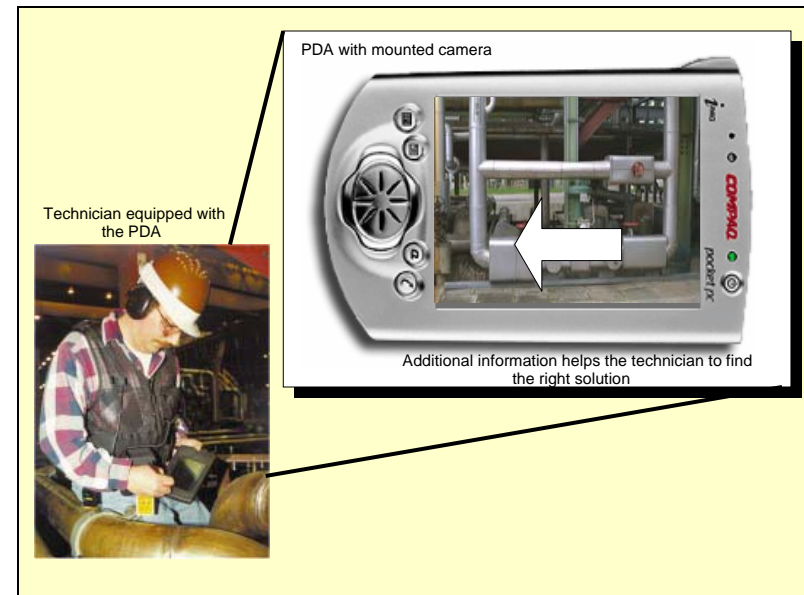
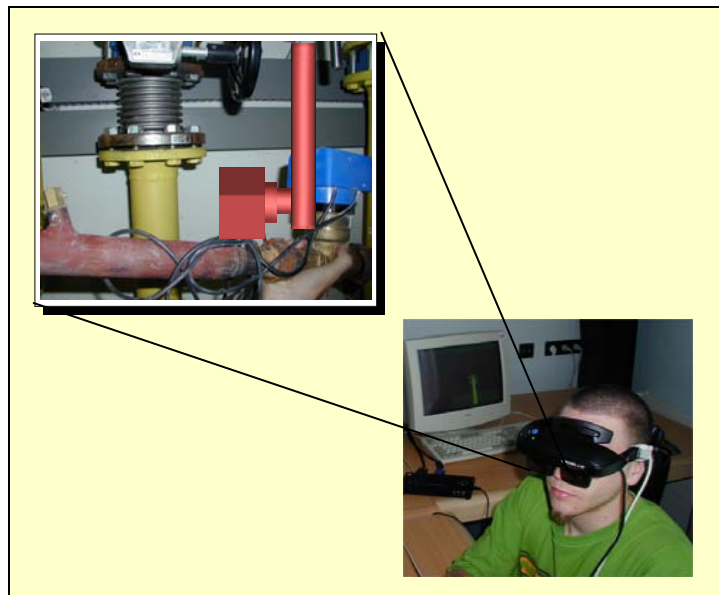
The OMV Refinery



- Complexity
- Walkthrough (Outdoor solution)
- Training / Learning scenario

Oil Refinery Application

- Indoor solution (Tracking system, iGlasses)
- Outdoor solution (Handheld/Tablet PC)



The scenario



- Checkpoint
- More details
 - Product pipeline
 - Look inside (magic lens)
 - Voice output
 - Technical data
- Usage of markers would be possible

The scenario II

- Complex object (i.e. pump) => 3D animation
 - What's inside?
 - Simple and easy to use
- The pipeline:
 - A short movie shows the path of the pipe X



Museum Application

- Establishing personalised visiting path
- Provide adapted information for disabled people
- Visualisation of missing pieces...



Museum Application II



- Interactive virtual museum
- Presentation of information in creative ways
- Establishing personalised visiting path
- Provide human-like assistance:
 - What should I visit next?

Conclusion and future work

- Development of the framework, of the gems and the components
- Authoring tool for MR
- Open Source (LGPL) ?
- Standardization of MR applications
 - We are looking for MR solutions (e.g. ARToolkit, 3DS Loader, MDL-, MD2-Loader etc.)
 - Good solutions are welcome!
 - We offer a solid MR base
 - Help us to make MR more popular!

Special thanks to...

all partners & members of the
AMIRE project



Contribution to Standards



Production Process of 3D Computer Graphics Applications-
CAMPFIRE Structures, Roles and Tools
ACM SIGGRAPH AND EUROGRAPHICS
Snowbird, Utah



- June 1-4, 2002 in Snowbird USA
- Interdisciplinary Workshop

Questions?

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